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UNCLASSIFIED- SOVIET BLOC INTERNATIONAL GEOPHYSICAL YEAR INFORMATION

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PLEASE NOTE

This report presents unevaluated information on Soviet-Bloc activities in the International Geophysical Cooperation program from foreign-language publications as indicated in parentheses. It is published as an aid to United States Government research.

"INTERNATIONAL GEOPHYSICAL COOPERATION" PROGRAM -- SOVIET-BLOC ACTIVITIES

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I. ROCKETS AND ARTIFICIAL EARTH SATELLITES

Sedov Comments on Pioneer IV

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An interview with Academician L. I. Sedov, in which the launching of the US Moon probe, Pioneer IV, was discussed appeared in 8 March Pravda. Sedov congratulated the US scientists and engineers on the achievement. The balance of the interview is an expansion of the following statement by Sedov: "Side by side with the launching of large rockets similar to the Soviet cosmic rocket [Mechta] into the cosmos, the launching of small "Pioneer"-type rockets for scientific research operations is very useful." ("On the Launching of a Cosmic Rocket Toward the Moon by the US; Interview With Academician L. I. Sedov"; Moscow, Pravda, 8 Mar 59)

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II. UPPER ATMOSPHERE

Johnston Island Firings Suggested as Cause of Low-Latitude Aurorae by Soviets

An interview with Professors I. S. Shklovskiy and V. I. Krasovskiy on the newly discovered radiation belts appeared in a recent issue of Izvestiya.

Investigations with artificial earth satellites led to the discovery of a completely new phenomenon, a "corona" of the Earth, an accumulation of fast charged particles beginning at an altitude of about 500-1,000 kilometers. The great majority of these particles are electrons possessing energies of several thousand to hundreds of thousands electron volts.

The zones where the fast charged particles are concentrated are clearly defined and the concentration of particles in them is so large that this phenomenon was registered by several groups of researchers, even by those whose instruments were assigned to other problems. It is possible to call this phenomenon the "corona" of the Earth, analogous to the corona of the Sun, as it is also composed of charged particles.

The zone of greatest concentration of these charged particles reaches seven to eight earth radii from the Earth's surface. This was established in experiments on the Soviet cosmic rocket by S. N. Vernov, Corresponding Member of the Academy of Sciences USSR, and A. Ye. Chudakov, Candidate of Physicomathematical Sciences. This discovery, say Shklovskiy and Krasovskiy, is a great achievement of Soviet science.

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The zone of charged particles consists of two regions. The first region is near the Earth's surface and is located mainly over the comparatively low latitudes of the globe. The concentration of particles inside this region is not the same. It reaches a maximum at an altitude of about 10,000 kilometers.

The second region has a considerably greater extent, reaching an altitude of 40,000-50,000 kilometers and embraces almost all of the Earth. Here the concentration of charged particles is greater than in the "lower" region. It also has a maximum where the number of particles per unit volume is a hundred times larger than at the edges of the region.

From earlier published results of investigations conducted in artificial earth satellites it is known that the particles in the first "low" [inner-belt] region have a considerably greater energy than in the second region [outer belt].

The discovery of these zones of charged particles is of great interest not only for astrophysics and geophysics but it is important also because manned cosmic craft must fly through it, and it is necessary to know what effect these radiations can have on living organisms.

Shortly after this phenomenon was discovered, fears were expressed concerning the danger this zone, with its high concentration of charged particles, would have for future cosmonauts. Electrically charged particles striking the shell of a space ship will produce X-rays during deceleration, which, in certain doses, are fatal to a living organism.

The investigations conducted by the Soviet cosmic rocket showed that this danger is less than originally supposed, but, nevertheless, certain protective measures are necessary to safeguard the crews of future cosmic craft from X-radiation.

Several different viewpoints on the origin of this accumulation of charged particles exists today.

S. N. Vernov and A. I. Lebedinskiy, Soviet scientists, consider that these charged particles are formed as a result of neutron decay arising in the comparatively low layers of the atmosphere from the bombardment of primary cosmic rays. Protons and electrons are among the products of this decay. Under certain conditions, these charged particles cannot leave the region in which they are found but become "prisoners" of the Earth's magnetic field. The accumulation of charged particles in such a magnetic trap also explains their increased concentration.

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Profs Shklovskiy and Krasovskiy are developing another theory on the nature of the "corona" of the Earth, as are a number of other investigators. This opinion holds that fast electrons found in this zone have nothing in common with cosmic rays. They arise in the uppermost layers of the atmosphere at distances of several earth radii because of the action of accelerating processes which are found at these altitudes. Although the details of this acceleration process is still not clear, it appears that the deciding factor in it is the interaction of the Earth's magnetic field and the flow of charged particles (corpuscles) emitted by the Sun. The interaction of the Earth's magnetic field and the disturbing streams of solor particles and solar fields creates favorable conditions for the acceleration of the charged particles.

According to the Vernov-Lebedinskiy theory, these particles enter the trap of the Earth's magnetic field later on. However, Shklovskiy and Krasovskiy, consider that at times, under the energetic influence of the Sun, such a trap would be partly opened also in the regions adjoining the Earth's poles, and the fast electrons would burst forth into the lower regions of the atmosphere causing aurorae. Thus, the phenomena of aurorae and magnetic storms, the nature of which was only guessed at for a very long time, becomes more clearly understandable thanks to the discovery of zones of fast charged particles.

Particles with a much higher energy are found over the tropic belt of the Earth in the first "low" zone. It is suggested that this zone could have an artificial origin.

This theory is based on the fact that the testing of nuclear weapons by the US at high altitudes in rather low latitudes (Nevada and the Pacific Ocean) coincided with the appearance of aurorae in this region. The case of high altitude nuclear bomb tests over Johnston Island and the appearance of aurorae some 3,000 kilometers away, which was reported in the English magazine Nature, is presented as supporting this theory. The fact that the aurorae were seen in the very region of the globe where they almost never occur, and that the place of the explosions and the place of the aurorae lie on the same magnetic force line is considered to be very important. This led the author of the article [Nature] to conclude that the unusual aurorae were caused by charged particles formed by the radioactive decay of the products of atomic explosions.

Shklovskiy and Krasovskiy add that the products of high-altitude nuclear explosions in the low latitudes have another fate, since the structure of the magnetic field in these places is different and "sucks" the charged particles into interplanetary space.

The phenomenon, reported in the article in Nature clearly indicates that during high altitude nuclear explosions in the southern latitudes, enormous quantities of electrons are formed which are capable of penetrating to great altitudes. Part of these will accumulate in the trap of the Earth's magnetic field. In particular, if such explosions occur over Nevada, the electrons can ascend to an altitude of about 10,000 kilometers, that is, enter into the first "low" region.

Shklovskiy and Krasovskiy claim that their calculations indicate that several such high altitude explosions are fully adequate for the formation of a region of fast charged particles.

They say that it is premature to conjecture on the effect this zone has on geophysical processes on the Earth, but it cannot be discounted that it can have this [aurorae] or another effect on the atmosphere. This circumstance again supports the correctness of the position of opponents of experimental nuclear explosions and the use of nuclear weapons in general. ("'Corona' of the Earth," Interview With Professors I. S. Shklovskiy and V. I. Krasovskiy; Moscow, Izvestiya, 8 Mar 59, p 6)

News in Cosmic Ray Studies

Excerpts from a newspaper article under the above title follow:

"...It is now possible to give information on cosmic rays close to the Earth and at distances over 100,000 kilometers from the center of the Earth. The first illustration shows the dependence of radiation intensity on distance from the Earth's surface.... It is evident that at distances greater than nine times the radius of the Earth, the intensity is practically constant. Analysis of the composition of cosmic radiation in interplanetary space showed that almost all particles have energies measured in the hundreds of millions of electron-volts or greater. Quite different conditions exist close to the Earth, that is, at distances of several radii of the Earth. The graph shows that the radiation hazard is hundreds of times greater than in interplanetary space. Analysis of the radiation in this region showed the presence of X-rays caused by electrons bombarding the container of the scientific apparatus.

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It was thus observed that a large number of electrons revolve around the Earth at distances up to 50,000 kilometers. As to the energy of these electrons, the rocket showed that it was only 30,000-100,000 electron-volts. Only a thin layer of material is required to absorb electrons of such low energy, so defense against the harmful effect of such radiation is possible As the illustration shows, the intensity of cosmic rays is very low at great distances from the Earth. There is no basis then for fearing radiation sickness in organisms which will fly to other planets. It should not be forgotten, of course, that explosions infrequently occur on the sun. The sun then becomes a source of cosmic rays and the whole solar system is filled with death-dealing radiation. The sun was in a relatively quiet state during the flight of the Soviet rocket. Under such conditions, the road to interplanetary travel is open.

The cosmic rocket indicated that the concentration of particles increases sharply at greater distances from the Earth. There are 700 times more particles at 15,000 kilometers than at 400 kilometers, on the same line of force. This means that only one out of 700 particles at an altitude of 15,000 kilometers reaches the low altitudes and that all the remaining 699 oscillate along the line of force, moving from one hemisphere to the other and not reaching lower altitudes.

It has thus been experimentally proven that particles move in an oscillatory motion around the Earth. They wander about for a long time, caught in the magnetic trap created by the Earth's magnetic field. These phenomena are similar to those in which physicists are attempting to create thermonuclear reactions.

Thus arises the unique aureole of particles which we call "corpuscular radiation." The following hypothesis has been given as to the cause of this radiation: the earth becomes a source of nuetrons under the action of cosmic rays; the neutrons partially decay on flying away from the Earth. Thus arise the electrons and protons held in the mangetic trap close to the earth.

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Similar aureoles should exist around other heavenly bodies possessing magnetic fields. Only cosmic rockets can give the answer to the question. ("News in Cosmic Ray Studies," by S. Vernov, Corresponding Member of the Academy of Sciences USSR, and A. Chudakov, Candidate of Physicomathematical Sciences; Moscow, Pravda, 6 Mar 59, p 4)

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Cosmic Ray Studies in the Yakutsk Cosmic Ray Laboratory

The Laboratory of Cosmic Rays, Yakutsk Affiliate of the Academy of Sciences USSR, is conducting a series of invetigations during the IGY period in the field of variations in cosmic rays. Some results of these operations, the apparatus, and the methods of observation are presented in source.

The city of Yakutsk (51.0 geomagnetic latitude 193.8 E, 100 meters above sea level) was selected because of the particular temperature regime over the central part of the Yakutsk Republic and the favorable geophysical location of Yakutsk, which lies on the same meridian as that on which the Bukhta Tiksi (to the north) and Irkutsk (to the south and somewhat west) stations are located.

The program of operations being carried out during the IGY by the Laboratory of Cosmic Rays, Yakutsk Affiliate, Academy of Sciences USSR, provides for the creation of complex recording apparatus ensuring continuous measurements of variations of the various components of cosmic radiation in a wide interval of the energy spectrum, ensured by the use of these instruments, and the detailed study of the results.

Measurements of the total intensity of cosmic rays with the aid of portable and light instruments launched into the stratosphere in sounding balloons are made for establishing the possible correlations between the intensity of the total components of primary radiation and solar activity.

Soundings are made simultaneously in Yakutsk, Moscow, and Murmansk two to three times a day. This work is performed jointly with the Physics Institute imeni P. N. Lebedev, Academy of Sciences, USSR, under the supervision of S. N. Vernov, Corresponding Member of the Academy of Sciences USSR.

The study of variations in the intensity of the low energy component of primary cosmic radiation is conducted using standard automatic apparatus, the neutron monitor. In the first stage of the work, it is proposed to obtain information on the correlation of variations of the low energy components of primary cosmic radiation with the activity of the Sun and with geomagnetic effects. In the future, the study of these relations as a whole, with variations of other components, presents special interest for investigations of the energy spectrum of particles determining the different types of variations. Work along these lines is conducted together with NIZMIR (Scientific Research Institute of Terrestrial Magnetism, the Ionosphere, and Radio Wave Propagation) of the Ministry of Communications USSR.

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The investigation of variations of the mu-meson components of cosmic rays near sea level is also conducted.

Underground investigations of the variations of mu-meson components of cosmic rays are conducted in the underground laboratory at Yakutsk. This measurement of the intensity of the hard components of cosmic rays is made with the aid of several GS-60 counter telescopes connected with triple coincidence circuits. These studies were made by the Laboratory of Cosmic Rays, together with the Moscow State University.

The investigation of variations in the frequency of the appearance of extensive atmospheric showers of cosmic rays [ShAL] is also part of the program of work at Yakutsk.

Observations of cosmic rays were begun at Yakutsk from the first day of the IGY, 1 July 1957, using ASK-1 counter telescopes, small apparatus for extensive atmospheric showers and registering the frequency of primary particles with an energy of $3 \cdot 10^{15}$ electron volts, and an electron monitor.

A cubic telescope was placed in operation at Tiksi on 20 August 1957; an ASK-2 camera was first used the following December; and a large ShAL apparatus registering particles with an energy of $7 \cdot 10^{15}$ electron volts, on 1 January 1958. Stratospheric measurements were begun in December 1957.

Investigations of variations in the intensity of the different components of cosmic rays during periods of magnetic storms characterized by an abrupt beginning and gradual growth, showed that these storms exert a perturbing action on primary particles possessing energies of 80-170 billion electron volts. Thus, instruments located at a depth of 60 meters of water equivalent registering mu-mesons created by the more energetic primary particles did not record changes in intensity during the period of magnetic storms.

As a result of other work, it was discovered that magnetic storms having abrupt beginnings were accompanied by sharp decreases in the intensity of the hard and neutron components of cosmic rays. Preliminary calculations show that this effect occurs as a result of the flow of primary particles in the energy interval having an effective limit of not less than 80 billion electron volts.

It was also established that in the period of magnetic disturbances, 2-4 days after the sharp decrease in the intensity of hard components of cosmic rays, the amplitude and phase of diurnal variations also change rapidly in comparision with a magnetically quiet day.

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Preliminary results of the work were presented to the VI Plenum of the Commission on Meteors and Comets of the Astronomical Council, Academy of Sciences USSR, In Odessa 14-16 November 1955. ("Photographing Meteors and Their Spectra in Natural Color," by I. S. Astapovich, Institute of Physics and Geophysics, Academy of Sciences Turkmen SSR; Ashkhabad, Izvestiya Akademii Nauk Turkmenskoy SSR, No 5, 1958, Meteornyy Byulleten', pp 107-108)

Meteor Observations at Ashkhabad

Radio observations of meteors were organized for the first time in Ashkhabad by I. S. Astapovich in November 1944 and continued during the period of the Perseids in 1945-1946. These observations were paralleled by visual observations and with listening to meteor radio noises with headphones connected to the radio receiver. Radar observations of the Perseids on a 4.2 meter wave length, together with visual and photographic observations conducted from 1947, made it possible to determine the slant distance of the meteors, their linear height, and also to find the height of trails and the height of meteors in the principal classes. This work was continued in 1948, until interrupted by the 6 October earthquake. It was begun again in 1952 on the more powerful radar apparatus of another station.

Radio observations of the Orionid in 1953, which reached their maximum on 22 October, detected 190-220 radio meteors per hour on a frequency of 10-11 megacycles during the predawn hours. Quite unusual results were obtained on a subcritical frequency in December 1953 during the expected maximum period of the Geminids. At 0500 local time, in the apex of the radiants, the number of radio meteors per minute reached 120. Six thousand radio meteors were photographed on motion picture film, some frames showing 6-8 meteors simultaneously. At a peak power of several tens of kilovolts on a wave length of 33 meters, the minimum zenith brightness of the meteors was +10 stellar magnitude. This work was all conducted under I. S. Astapovich.

Work on this same apparatus was resumed in 1956 by Yu. A. Inozemtsev, G. A. Nasyrov, and V. Mollakov. The work was continued at the suggestion and under the direction of I. S. Astapovich.

The transmitter used had a pulsed frequency of 50 pulses per second, a pulse duration of 200 microseconds, and a peak power at pulse of 20 kilovolts. Recording was made on an EO-4 oscillograph with A-scope presentation. A transmitting rhombic antenna with a clearance height of 11.3 meters was used. Each side of the rhomb was 41 meters. The receiving antenna was a horitontal symmetrical dipole. Observations were made from 0100 to 0600. Visual observations were made, "splashing" of the images was noted, particularly stable images, and groups of meteors were observed, and separate images were photographed on motion picture

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film with a speed of 40 millimeters per minute. This speed was found to be inadequate and the radio meteors obstructed by noises. The diurnal maximum was at 0500 and the absolute maximum was on 22 October, coinciding with optically observed maximum of the Orionid shower. Several groups of meteor were noted. No effect was noted on the diurnal variation of the E_s layer from the sporadic Orionids.

The linear density of electron concentration α was calculated. If this is compared with the distance, then, naturally, increased α corresponds to larger slant distances.

Several tables are given in the article: Distribution of meteors in relation to duration; particularly stable images lasting over 30 seconds; the simultaneous groups of meteors noted; the distribution of radio images in relation to noise level. ("Radar Observations of the Orionids at Ashkhabad in 1956," by Yu. A. Inozemtev, G. A. Nasyrov, and V. Mollakov, Institute of Physics and Geophysics, Academy of Sciences Turkmen SSR; Ashkhabad, Izvestiya Akademii Nauk Turkmenskoy SSR, No 5, 1958, Meteornyy Byulleten', pp 108-109)

III. OCEANOGRAPHY

Geological Results of Vityaz' Expedition

During 1957 and the first part of 1958, the research vessel Vityaz' of the Institute of Oceanology, Academy of Sciences USSR, conducted geological research in the western Pacific as a continuation and expansion of the studies of the Far Eastern seas and the northwestern part of the Pacific Ocean, which had been made by the Vityaz' during the preceding year. The investigations during 1957-1958 were conducted within the framework of the IGY. During the first 1957 voyage (the 24th voyage) of the Vityaz', which lasted from 17 April to 20 May 1957, seismo-acoustic studies of the earth's crust were made in the area of the Sea of Japan. The second 1957 voyage (25th voyage) of the Vityaz', from 28 June to 11 October 1957, included a system of survey runs in the ocean area to the west of the 154th meridian, from the shores of the Molucca and Philippine Islands to the shores of Japan on the north to New Guinea in the south. The third (26th) voyage of the Vityaz', from 5 November 1957 to 27 February 1958, was along two great circle (meridional) paths (for example, along the 172d meridion east and the 172d meridion west) and included almost the entire geographic area of the ocean from the temperate to the tropical and equatorial zones, from the shores of Japan on the north to New Zealand in the south.

In the two final voyages, geological research was conducted in conjunction with oceanological work, and the operations became extremely complex. This work was done in the following primary directions: a study of the underwater (bottom) relief, the collection of samples of the atmospheric and water suspension, the collection of samples of bottom deposits and rock core samples, seismo-acoustic soundings of loose deposits, and the photographing of the bottom of the sea. The collected data were also subjected to a preliminary processing.

According to data collected on the expeditions of the Vityaz', the thickness of the friable deposits in the deepest part of the Sea of Japan is 1.7 kilometers. Below this lies rock, the elasticity of which is close to that of basalt. This rock layer is about 7 kilometers thick. Below this rock layer is the Mokhorovicic stratum, and the total thickness of the earth's crust here is approximately 9 kilometers. The Mokhorovicic stratum dips toward the islands of Japan where, according to the data on surface investigations, the thickness of the crust is 40 kilometers.

Investigations of the open sea indicated that the surface of the ocean bed is divided by a system of long, wide ridges into a series of depressions or trenches. Widely distributed over the whole area of the bottom are underwater mountains of volcanic origin. However, the greatest concentration of these mountains is associated with the ridges. On the flat areas of the bottom of the trenches and on the slopes of the ridges, zones of tectonic dislocations, extending for thousands of kilometers, were detected.

Investigations of the transitional zones led to a more accurate representation of the deep-water trenches of the western limits of the ocean and of their maximum depths. The Vityaz' measured depths of 10,990 meters in the Marianna trench and 10,840 meters in the Tonga trench, which are the deepest known areas of the Pacific. Deep trenches and underwater ridges of island arches comprise a morphological complex, which is characteristic of the outer portion of the zone of transition. The bottom of the basin of the zone of transition comprises a multiplicity of tectonic features. The accumulation of sediments leads to a leveling of the original relief, with intensive filling-in of depressions. The morphological distinctions between various island arches and depressions, and also the distinctions between the many tectonic features of the bottom of the depressions and the degree of subsequent leveling of it by deposits, indicates the successive stages of development in the various sections of the zone of transition. For example, the trench of the Solomon Sea, the Philippine and Fiji trenches represent apparently less developed sections of the zone of transition than the trenches of the Bering, Okhotsk, and East China seas.

The characteristic peculiarity of accumulated sediments in the ocean represents the considerable differences in the rate of formation of sedimentary masses. Areas of intensive accumulation of contemporary deposits were found to be mixed with areas without accumulation and with areas of erosion of older sedimentary masses. An important role in the sedimentary accumulation and the development of the bottom relief is played by the horizontal transport of sedimentary material and the movement of the water near the bottom and of the highly mobile layer of concentrated suspensions of settling particles, and also suspension-carrying currents originating at the slopes of underwater elevations and at the bases of islands. The sediments of deep-water trenches universally contain rather large amounts of coarsely fragmental material, organic remnants, and volcanogenic material. ("Geological Results of the Expeditions of the Vityaz' in the Western Part of the Pacific Ocean," by G. B. Udintsev, Byulleten' Moskovskogo Obshchestva Ispytateley Prirody, Otdel Geologicheskiy, No 4, 1958, pp 152-153)

IV. GLACIOLOGY

Manual for Studying the Mechanical and Physical Properties of Ice

A 64-page manual, Izucheniye Mekhanicheskikh i Fizicheskikh Svoyvstv L'da Rukovodstvo [Manual for Studying the Mechanical and Physical Properties of Ice] was prepared by the working group on glaciology, Interdepartmental Committee for the Conduct of the International Geophysical Year USSR.

The purpose of the work is to set forth the most effective methods of studying the structure, phase state, and the thermal and mechanical properties of ice and, in part, of snow.

In the study of ice it is necessary to take into account all factors having an influence on its properties. The chief of these are the thermal regime, the migration of matter in liquid and gaseous form and even in a solid state, the structure, porosity, and the phase state.

In studying the mechanical properties of ice, it is necessary to know its structure, since the strength of ice crystals has a sharply defined anisotropy. In addition, the mechanical properties are determined to a considerable degree by the content of unfrozen water (brine) in the ice and the presence of pores. The phase and chemical composition of ice, in turn, depends on the temperature and the processes of migration. Which of the indicated factors and phenomena have a dominating effect on the properties being studied is specially determined for each specific case inasmuch as the conditions of the formation, the influence of the surrounding media, and the intensity of the processes for different forms of ice differ from one another.

The manual is divided into four parts: (1) Methods of Studying Ice Structures; (2) Measurement of the Density and Phase Composition of Ice; (3) General Instructions for Testing Ice for Strength; and (4) Methods of Studying the Thermal Properties of Ice. (Izucheniye Mekhanicheskikh i Fizicheskikh Svoystv L'da- Rukovodstvo, Moscow, 1957, Publishing House of the Academy of Sciences USSR, 64 pp)

V. ARCTIC AND ANTARCTIC

Drift Station Discovers new Submarine Elevation

On 15 February, the drift station Severnyy Polyus-6 passed over a considerable elevation of the ocean bottom which had not been recorded previously on any maps.

The abrupt decrease in depth from 4,321 to 2,862 meters was recorded on 14 February, and on the next day, the depth was only 730 meters. At this time, the station was at a point 86 54 N and 61 40 E, about 560 kilometers north of Zemlya Frantsa Iosifa.

The discovered submarine elevation is, so far, the highest elevation of the Arctic Ocean bottom encountered during the entire drift of Severnyy Polyus-6. Even in mid-June 1958, when the station was drifting over the Lomonosov Range, in the area between Novosibirskiye Ostrova and the North Pole, the minimum depth recorded was 1,043 meters. ("An Interesting Discovery"; Moscow, Vodnyy Transport, 17 Feb 59)

Official Transfer of Oazis to Poland

In accordance with the decision of the Soviet government, the scientific research station Oazis, 360 kilometers from Mirnyy, has been transferred, without compensation, to Poland.

Several days ago, the members of the Polish Antarctic Expedition, who arrived on the Mikhail Kalinin, were transported by planes and helicopters to their destination.

The official transfer ceremony took place on 23 January, at 1430 hours Moscow time. The transfer deed, which was written in Russian and Polish, was signed by Tolstikov in behalf of the Main Administration of the Northern Sea Route, and by Rozycki in behalf of the Polish Academy of Sciences.

Krzeminski, chief of the Polish Antarctic Expedition, expressed the sincere gratitude of the Polish scientists for the friendly act of the Soviet government.

The station has been named "Station Dobrowolski in Oazis." ("Station Oazis Is Transferred to Polish Scientists"; Moscow, Sovetskaya Aviatsiya, 25 Jan 59)

Ob' Arrives at Coast of Queen Maud Land

After separating from the Mikhail Kalinin at the edge of the polar ice, the Ob' headed for the Australian station Mawson, where a shipment of gasoline was unloaded.

On the way to the site of the future station Lazarev, all the expedition members aboard the ship were making intensive preparations for the principal stage of their voyage. The geologists checked their equipment and reviewed the routes for reconnaissance expeditions to the mountain areas. The AN-6 plane and KI-4 helicopter were made ready for operation.

The Ob' is now near the shore of Queen Maud Land. The most labor-consuming part of the operation will be the unloading of 900 tons of various freight for the new station. ("Ob' at the Shores of Antarctica"; Moscow, Vodnyy Transport, 14 Feb 59)

Site for new Station Selected on Glacier

According to the program of the IGC-1959 and the recommendations of the International Special Committee for Antarctic Research, the Soviet Complex Antarctic Expedition in establishing the new coastal Antarctic station Lazarev on Queen Maud Land. On 9 February, after conquering a belt of heavy pack ice, the Ob' cut its way through to the edge of the shore ice in the area of Princess Astrid Coast. Stormy weather made an exploration of the coast difficult. On 12 February, the expedition members finally unloaded the aircraft on the ice and began a reconnaissance of the coast.

During a 2-day period, the search for a suitable site for the new scientific station continued. A large section of the coast was surveyed from the air. No ice-free areas were visible anywhere in the vicinity. It was decided to organize the new station on a glacier.

On the eve of 14 February, the Ob' cast anchor in the ice at a distance of 6 kilometers from the location chosen for the station site. Unloading of the expeditionary freight began immediately.

Six polar scientists headed by Yu. A. Kruchinin will conduct scientific work at the station Lazarev. The program of scientific work will include observations in meteorology, glaciology, aerology, actinometry, and geography. The station will be located in two small, panel-type huts, housing the radio station, scientific laboratories, a general recreation room, and kitchen. While looking for a station site, a group of scientists headed by Prof M. G. Ravich set up a field camp on Queen Maud Land and began its scientific research activities. ("On Queen Maud Land"; Moscow, Vodnyy Transport, 17 Feb 59)

Antarctic Explorers Return Home

The diesel ship Mikhail Kalinin arrived in Riga on 4 March with returning members of the Third Antarctic Expedition. A meeting was held at the port, during which Hero of Soviet Union Ye. I. Tolstikov, chief of the Third Antarctic Expedition, made a speech. ("Explorers of Antarctica Return Home"; Moscow, Pravda, 5 Mar 59)

Soviet Expedition Members Receive Belgian Awards

The Belgian Embassy in Moscow announced that King Baudouin I had awarded medals to a group of Soviet citizens for the help rendered to members of the Belgian Antarctic Expedition, who suffered an airplane accident in Antarctica in December 1958.

The Order of Leopold I was awarded to Ye. I. Tolstikov, chief of the Third Continental Antarctic Expedition, and to V. M. Perov, commander of a Polar Aviation airplane. The remaining members of the crew, including V. V. Afonin, copilot; B. S. Brodkin, navigator; V. M. Sergeyev, flight mechanic; Ye. N. Men'shikov, flight mechanic; and N. G. Zorin, flight radio operator, were all awarded the Order of Leopold, and V. M. Makushok, the interpreter, was awarded the Order of the Crown. ("Belgian Awards to Soviet Polar Expedition Members"; Moscow, Pravda, 3 Mar 59)

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Scientists Measure Ice Thickness

During their expeditions into the interior of Antarctica, Soviet scientists were able to determine the thickness of the ice cover and the elevation of the Antarctic glacier bed. The greatest ice thickness, 4,000 meters, was found at a short distance to the south of Pionerskaya. On the other hand, southwest of the station Sovetskaya, the ice was found to be not more than 1,000 meters thick.

[Note: The above paragraph is an excerpt from a half-page article on page 4 of Pravda, 8 March 1959, summarizing the activities and achievements of the Third Soviet Antarctic Expedition, which has just returned to the USSR.] ("A Year in Antarctica"; Moscow, Pravda, 8 Mar 59)

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